

**Oral Pulse Granuloma: An Unusual Finding in Pediatric Patient – A Case Report**

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**Conflicts of Interest:** Nil

**Abstract**

Oral cavity is the most common site for encountering the foreign body reaction. In past few years, several cases of unusual giant cell lesions have been reported in posterior mandibular ridge in particular. Oral Pulse Granuloma results from implantation of vegetable materials in oral tissue. Most of the time, Pulse granuloma is encountered on histopathological examination of intra-oral or extra-oral lesions. Various authors have defined it with different nomenclatures with undefined etiology. The purpose of this study to bring awareness to the dentists regarding unusual appearance of the Oral Pulse Granuloma in pediatric patients.

**Keywords:** Oral Pulse Granuloma; Hyaline Rings; Pediatric Patients; Giant Cell Lesions

**Introduction**

Oral Pulse Granuloma is a foreign body reaction characterized by collection of hyalines, formed due to degeneration of tissue.<sup>1</sup> It is closely related to Periapical Granuloma<sup>2</sup> and can be confused with hyaline vasculopathy morphologically.<sup>1</sup>

Originally described as “Inflammatory Lesion in Buccal Sulcus” of lower denture wearers by Lewars<sup>3</sup> in 1971, it was later termed as “Chronic Mandibular Periostitis associated with Vasculitis” by Rannie<sup>4</sup> in 1975 and “Giant Cell Angiopathy” by Dunlop and Barker<sup>5</sup> in 1977. King<sup>6</sup> first termed it as “Pulse Granuloma” in 1978. Chou et al<sup>6</sup>

described it as “Hyaline Ring Granuloma”, “Chronic Periostitis”, “Granuloma in Edentulous Jaws”, “Oral Vegetable Granuloma” and “Food Induced Granuloma”. He classified these lesions as Central and Peripheral lesion as per the location, Central being asymptomatic and Peripheral lesion being painless submucosal swelling<sup>6</sup>.

As per histochemical and immunohistochemical analysis, Luiz Alcino Gueiros<sup>7</sup> concluded that, it is caused by traumatic implantation of vegetable particles in extraction socket or oral ulcer with cellulose being responsible for granuloma formation.

Common sites include

1. Edentulous portion of alveolar ridge with history of extraction
2. In periapical lesion with tooth subjected to endodontic treatment/ prolonged open drainage
3. In the wall of residual, dentigerous and nasopalatine cyst
4. Retained roots/ impacted lower third molar with pericoronitis
5. As a complication to periodontal surgeries<sup>7</sup>

The occurrence of Oral Pulse Granuloma is in itself a rare finding in pediatric patient. The present case is the rarest of all because of the site of occurrence being the upper lip, making it unique.

### Case Report

A 12 years old girl patient reported to Department of Pedodontics and Preventive Dentistry in College of Dental Sciences, Davangere, with a chief complaint of swelling on the upper lip region.

Case history revealed the growth to be initiated as a pin point swelling which gradually increased in size within 2 weeks. Patient had a habit of upper lip biting and patient had a lesion because of the same 3 weeks back on the same site. On examination, intra-orally a nodular growth was noted in the midline of upper lip measuring 1 x 1 cm

which was round in shape with a pedunculated base, firm in consistency, non-tender on palpation. The growth was pinkish in color with smooth borders (Fig 1).



Fig 1: Pre-op Image

Based on the history and clinical features, a provisional diagnosis of Fibroma was made.

After routine hematological examinations (Fig 2), surgical excision was performed under local anesthesia (Fig 3-8) following which the patient was prescribed analgesics and antibiotics. The specimen was sent for histological examination (Fig 9).

COLLEGE OF DENTAL SCIENCES DAVANGERE, 577 004, KARNATAKA.		LABORATORY INVESTIGATIONS REPORT HAEMATOLOGY and SEROLOGY			
Name	[Redacted]	Sex	<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	OPD No.	[Redacted]
Age	12	DEPARTMENT	Pedodontics	Referred by	Dr. [Redacted]
TEST		REPORT	NORMAL VALUES		
Hb estimation	11.6 gm% gm%	14-18 gm% (males), 11.5-15.5 gm% (females)			
PCV	34.4 %	42-52% (males) 36-48% (females)			
ESR	12 mm/hr	0-15 mm (males) 0-20 mm/hr (females)			
RBC Count	4.2 x 10 <sup>12</sup> /mm <sup>3</sup>	4.5 - 10 <sup>12</sup> /mm <sup>3</sup>			
Platelet count	1.4 x 10 <sup>11</sup> /mm <sup>3</sup>	1 x 10 <sup>11</sup> - 4 x 10 <sup>11</sup> /mm <sup>3</sup>			
Total WBC count	14,600 cells/mm <sup>3</sup>	4000 - 10,000/mm <sup>3</sup>			
Bleeding time	2 min	1 - 5 mins			
Clotting time	12 min	4 - 6 mins			
Blood grouping (A, B, O)	/				
Blood grouping (Rh)	/				
Differential count					
Neutrophils	60.1 %	40-75 %			
Lymphocytes	34.4 %	20-45 %			
Eosinophils	0.2 %	01-04 %			
Monocytes	0.3 %	02-08 %			
Basophils	0.0 %	00-01 %			
Fasting Blood sugar	/	70-100 mg %	Method: TRINDERS using semi auto analyser		
Post prandial blood sugar	/	70-140 mg %	Freshly identified with hyperglycaemia		
Random blood sugar	/	70-160 mg %	confirm diabetic status by FBG & PPFD		
SEROLOGY			Method: Rapid Card Test		
HIV	/		Sample found to be reactive by this screening test, must be confirmed by standard supplemented assay like WESTERN BLOT, ELISA OR PCR.		
Hepatitis B	/				
PT	/	11 - 16 Seconds			
INR	/	2.0 - 3.5			
APTT	/	22 - 32 Seconds			
Remarks:					
NOTE: Above mentioned values are laboratory findings and are to be correlated with clinical findings for diagnostic purpose.					
Signature of the Lab Technician		SIGNATURE OF THE HEAD OF THE DEPARTMENT			
Date: 11-01-18					

Fig 2: Hematological Report



Fig 3: Anesthesia Administration



Fig 6: Demarcating the Boundaries of the Lesion



Fig 4: Initial Incision



Fig 7: After Curettage



Fig 5: Exposing the Lesion



Fig 8: Suture Placement



Fig 9: Excised Lesion



Fig 10: 15<sup>th</sup> Day Follow-up

The patient was recalled after a week and after 15 days for suture removal and follow-up (Fig 10). Oral hygiene instructions were explained to the patient. The patient didn't report of any discomfort henceforth.

### Discussion

Oral Pulse Granuloma is a rarely reported oral inflammatory lesion<sup>8</sup> with undefined etiology.<sup>7</sup> Most of the time presented as histopathological diagnosis, it appears as ovoid, spherical or irregular bodies surrounded by fibroblasts, inflammatory cells and giant cells.<sup>9</sup> Clinically, it mostly appears as asymptomatic nonspecific mass, firm or fluctuating in the oral cavity.<sup>1</sup>

It has the most controversial etiopathogenesis.<sup>10</sup> Two theories of etiopathogenesis has been proposed: (i) Exogenous Theory which states that the origin of Hyaline Ring is due to the foreign material having penetrated the oral mucosa or gastrointestinal tract and lungs, and (ii) Endogenous Theory which states that the rings are formed due to the hyaline degenerative changes in walls of blood vessels.<sup>11</sup> Talacko and Radden<sup>9</sup> hypothesized that once food particles enter tissue, it is rapidly digested and altered by host responses. The cellulose moiety being indigestible, persist as hyaline material, inciting granulomatous response.

Adkins<sup>12</sup> considered it as foreign body granuloma with hyaline material being foreign body with unknown origin. Levison et al.<sup>13</sup> in their studies indicated the implantation to occur without gross trauma too and revealed the presence of wide range of elements in routine biopsies. Harrison and Martin<sup>8</sup> performed ultrastructural investigations and based on it suggested hyaline ring composed of cellulose and hence proposed term "Oral Vegetable Granuloma".

Analyzing the conclusion made by Luiz Alcino Gueiros<sup>7</sup>, in the present case, since the patient had a habit of upper lip biting, that had caused the trauma. The implantation of the vegetable material would have occurred during the healing phase of the lesion which had occurred due to the lip biting, developing into the Oral Pulse Granuloma.

On H & E staining of the excised tissue, histological examination revealed a central foreign body (vegetable matter) surrounded by bundles of collagen fibres admixed with inflammatory cell infiltrate composed of lymphocytes, plasma cells, neutrophils, macrophages along with blood vessels (Fig 11). Final diagnosis of **Oral Pulse Granuloma** was made.

COLLEGE OF DENTAL SCIENCES D.V.ANGERE-577 004, KARNATAKA DEPARTMENT OF ORAL PATHOLOGY AND MICROBIOLOGY		TO BE FILLED BY THE RECEIVER	
HISTOPATHOLOGY REPORT		Time	Date
Name: Mr./ Miss / Mrs. [Redacted]		3-15 P.M	20-6-18
Age: 12 Yrs Sex: <input type="checkbox"/> Male <input checked="" type="checkbox"/> Female		Signature	Name
CPD No. [Redacted]		[Signature]	SINDHIA
Biopsy No.	HP 111/18	Cytology No.	-
Previous Biopsy No.	-	Previous Cytology No.	-
Referred By: Dr. Amit Kumar Pathak	DEPARTMENT: Pedodontics		
<p><b>Macroscopic features:</b></p> <p>Received single bit of soft tissue, creamish in colour, roughly round in shape, with irregular surface and regular borders, measuring 0.6x0.6x0.4cm in its greatest dimensions, firm in consistency. Complete bit was taken for processing.</p> <p><b>Microscopic features:</b></p> <p>H&amp;E stained tissue section reveals a central foreign body (vegetable matter) surrounded by bundles of collagen fibres admixed with inflammatory cell infiltrate composed of lymphocytes, plasma cells, neutrophils, and macrophages along with blood vessels. LS and TS of muscle bundles and nerve bundles. Focal oedematous tissue in the region of inflammation is also evident.</p> <p><b>Site:</b> Midline of upper lip below the vermillion border</p> <p><b>Provisional diagnosis:</b> Lipoma/Fibroma</p> <p><b>Final diagnosis:</b> Histopathological features in correlation with clinical findings are suggestive of Oral pulse granuloma.</p>			
Date: 20/6/18		Oral Pathologist	

Fig 11: Biopsy Result

### Conclusion

Oral Pulse Granuloma are very rare but well-defined oral finding caused due to implantation of cellulose moiety in the tissue.

Since being a rare finding in the pediatric patients, any rapidly growing lesion in a pediatric patient requires through clinical, radiographical and histopathological examination to rule out any possible malignant lesion and also Oral Pulse Granuloma should be considered as a differential diagnosis for the same.

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